



# The Iowa Policy Project

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## **EXECUTIVE SUMMARY**

### **Saving Resources: Manure and Water**

*Assessing Agricultural Policy Implications for the Mississippi River Basin*

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Agricultural runoff from cropland into waterways is a primary and chronic threat to Iowa's water quality. High levels of phosphorus and nitrogen in manure can contaminate waterways if manure is spread on frozen, snow-covered or saturated croplands. State law and policy represent Iowa's commitment — or lack of commitment — to oversight and enforcement of manure application requirements, which has a direct bearing on efficient use of nutrients for agricultural production, water quality, costs to water systems and public health.

This report focuses on nutrient runoff pollution from Iowa's cropland to the Mississippi River system. We examine why this is a problem, paying particular attention to how nutrient runoff negatively affects local and regional water sources. We then outline policies Iowa has in place to address this problem and compare them to recent changes in the state of Ohio. We conclude with recommendations to protect the future health of our waterways.

#### **The High Risk of Winter Manure Application**

Manure is an important resource that can be sustainably utilized to enhance crop production. Since manure can be a cheaper source of nutrients than commercial fertilizer, farmers have an incentive to utilize its value, and also an incentive not to let manure run off cropland and become a problem to Iowa lakes and streams. However, some soil conditions pose special problems for the producer. Unlike normal soil, frozen soil is difficult to penetrate due to water saturation that occurs between freezing and thawing cycles during typical Midwestern winters.

When manure is applied to frozen soil its nutrients are not fully absorbed, leaving more manure on top of soil that could run off into nearby waterways during snowmelts and spring rain. Furthermore, the different rates at which manure and soil thaw present another problem; if manure thaws first, water stored in snow packs could melt and carry the unabsorbed manure toward streams. In this case rain is not even necessary for nutrient runoff to occur. However, rain alone can be an additional problem. Applying manure to saturated ground can also reduce the use of the nutrients to crops and add to pollution, when the nutrients do their job in rivers and lakes and not on farm ground. Thus, timing is paramount to the successful application of manure.

Research illustrates why the risk of runoff is particularly high when manure is applied in late winter. One two-year study compared the loss of nitrogen from surface runoff across four different manure application times. Its findings show that applying manure in late winter results in an average loss of 41 pounds of nitrogen per acre of corn stubble — more than twice the nitrogen loss during early winter applications and more than 10 times the amount lost in spring applications.

## **The Negative Impacts of Manure Runoff**

Manure runoff has both environmental and economic repercussions. From an environmental standpoint, manure runoff has been linked to fish kills, beach closures, incidents of contaminated drinking water, and hypoxia, a condition that starves water of oxygen and can leave a body of water lifeless as a result, causing ecological and potentially economic harm. For farmers, manure runoff often results in a higher fertilizer bill. Manure lost from runoff must be replaced by commercial fertilizer. That imposes an economic burden on farmers, but the harmful effects of nutrient pollution are often felt most by communities downstream. While runoff from manure applications is not the sole source of nitrate pollution, it contributes, especially when applied during the winter.

Another consequence of nutrient runoff is the creation of the hypoxic region, or “dead zone” as it is also called, located in the northern Gulf of Mexico where the Mississippi River empties. Hypoxia in the Gulf is caused by excess nitrogen and phosphorous delivered by the Mississippi-Atchafalaya river system. The high levels of nutrients promote the large algal blooms and when the blooms die and decay a high amount of oxygen is consumed, killing fish and other organisms and leaving the area lifeless as a result. By reducing runoff caused by inappropriate manure application, the nutrient load to the hypoxic zone could be significantly reduced.

## **How Iowa Policies Fall Short**

Iowa policies to mitigate the amount of manure runoff during winter months do not go far enough. First, regulations do not apply to smaller facilities. Second, the law fails to include some conditions when manure might be lost, such as saturated ground, to the detriment of producers and the environment. The law’s numerous exemptions add to the degree of vagueness and complexity, making it rife for potential abuse or honest mistakes. Iowa also does not compare well to other states in staff to enforce rules and regulations. Iowa stands out because it has so few staff relative to the number of facilities needing oversight. Confusing winter manure application regulations exacerbate this challenge.

## **Policy Recommendations**

Weak state laws and few inspectors compromise Iowa’s water quality and endangering our citizens’ health. As it currently stands, Iowa’s law is a “both and” statute; the ground must be impermeable *and* be within the dates specified before manure application is limited. These restrictions are both inadequate and confusing to farmers and neighbors concerned about water quality. Our research has led us to recommend the following:

- An outright ban on manure application in liquid form from medium and large animal production facilities when the ground is frozen or snow-covered, when the top two inches are saturated from precipitation or when weather is expected that will be detrimental to the environment and to the utilization of the manure.
- Ample “boots on the ground” enforcement capabilities with long-term funding allocated to maintaining adequate staffing.
- Immediate adoption of restrictions on all operations at 300 animal units (AU) or more for manure application during unfavorable soil conditions.
- Progress toward placing application restrictions on all facilities above 100 AU in size.

To maximize the benefits of manure for farmers, the environment, and communities downstream, Iowa must address the interaction between manure and soil that can absorb it. Doing so will require implementing a ban when the potential for runoff is greatest. Iowa should be proactive. Iowa does not have to wait for one of our cities to lose its drinking water before we act.